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| Group: | 2nd grade ICT class with ELLs |
| Teaching Point: | After having learned about where our trash goes, Students will learn how composting can be one solution to our sustainability efforts and how using worm bins to compost can be a sustainable effort in our greenhouse. |
| Vocabulary:  Materials: | Trash / waste / garbage, reduce / reduction, compost / composting / compostable, organic materials, sustainability, resources, food scraps, worms, observe / observation  Chart of waste journey, Plastic bins with holes in lid, food scraps like fruit / veggie scraps and coffee grounds, newspapers, spray bottles with water, 1 lb red wiggler worms, paper, pencils, crayons |
| Warm Up:  (5 mins) | Review students’ understanding/retention of where our waste goes. Show chart of waste journey in NYC to help Ss remember.  Then ask Ss,  🡪 What are some of the results of putting trash into our landfills?  🡪 What are some ways we can reduce or lessen the amount of trash or waste we send to the landfill?  🡪 Does anyone know what we can do with the food we throw out besides putting it in the garbage where it will be sent to a landfill?  (Elicit composting or introduce concept of composting).  🡪 How is composting an effective means of reducing waste? |
| Teach:  (10-15 minutes) | Inform the Ss that composting is an effective way to reduce our waste because it is less waste being sent to the landfills and less methane being sent into the atmosphere (which is bad/detrimental for the environment). Also, in many parts of the NYC, our organic materials will get picked up and composted by the city! So we don’t have to do much more than we already do.  Inform Ss that in the greenhouse, even though we don’t use soil to grow our plants, we use worms to help us compost. We then donate our rich composted soil to our garden beds outside of school.  Have Ss gather around a table with a plastic bin on it. Tell Ss that today they are going to learn how to make a simple worm bin. They are going to observe what the worms look like, how they move, what they eat; they are going to be able to write a “How To Build a Worm Bin” writing piece and they are even going to build their own worm bin. Show them the “ingredients” of the worm bin (placed in piles on plates on the table) while explaining how it works.   * Long hand-torn strips of newspaper make the bedding for the worms. (Have Ss rip a few strips of newspapers to help me) * The bedding is placed into the bin and then a spray bottle is used to wet the newspaper until it’s wet but not soaked and dripping. Model for the students. Explain that different animals/insects thrive in different types of environments. Red Wigglers happen to like a moist environment that is not too hot or too cold, and definitely not dry. (Have a few students give the bedding some good sprays) * Food scraps like apples, banana peels or vegetables are cut into cube sized pieces and placed in 3 corners of the bin. (Ask for volunteers to place the food in the bin) * Coffee grounds are placed into the 4th corner of the bin. * Once, the newspaper is appropriately wet, the newspaper is lifted and the worms are placed underneath. Put the newspaper on top of the worms and close the bin. (Ask for a volunteer to lift the wet bedding and another to dump the worms in. Ask a brave volunteer to pick up any worms that cling to the container.) * Explain how long it takes for the worms to turn the food into compost and how this compost can be used with soil for plants.   So, what do we do with the compost once it’s “done"? What do plants need to grow and thrive?  Restate to Ss that plants need nutrients to grow. Part of the way we keep our greenhouse plants growing is by adding nutrients to the water. Plants that grow in soil also need nutrients. How does composting old food scraps help plants? The food scraps that we placed into the worm composting bin are broken down by bacteria and the worms. The worms then produce a brown like compost which looks like soil. This brown soil is now filled with nutrients thanks to the worms. Plants need nutrients to survive, so the compost helps plants to stay alive, to be healthy and to grow, which is a basic life function. Once our compost is ready, we can mix it into the soil in our garden outside to ensure the plants have enough nutrients to thrive.  Tell Ss that today they are going to be working in groups at different centers where they will be interacting with worm bin composting. Introduce the centers and the groups (some classes will be able to choose their centers; others will need to be assigned groups). Explain how each group will have about 5 minutes per center. When the timer goes off, we will go to the next center. |
| Independent Activity (with differentiation / small group embedded within the centers):  (20-25 minutes) | Centers:  1st Center: Ss observe red wiggler worms in the worm bin. They can open the top and uncover the bedding to observe how they move, note the food that’s in there and the other “bedding”. Talk to one another about their noticings. Make note of all that they see to prepare to draw and sketch the contents of a worm bin.  2nd Center: Students draw and label a worm bin. Using color to add to the richness of the drawing. Using words from the word wall to label the important parts.  3rd Center: Writing – Ss write about how to build a worm bin. Ss use sequential words, (first, next, then, etc.) to clearly explain how to create a working worm bin. Ss can work in pairs if necessary.  4th Center: Ss put together a worm bin from start to finish (without adding worms yet, so each group has a chance to “build” a worm bin). Para-pro will work with Ss in this group to guide them if necessary, but Ss will mostly rely on the use of a guide with written instructions in order to make a worm bin. |
| Assessment #1:  Assessment #2: | Monitor the different centers to check for understanding / manage student behavior. Provide oral feedback (where possible) if students need support or reinforcement.  See Student Rubric at the end of this lesson plan. |
| Follow Up / Reflection: | May need to adjust the student groups within centers depending on personalities. May need to allot more or less time so every group gets to each center. |
| Standards: | NYC Science Scope & Sequence:  7.1a, 7.1b Human influences on the environment: positive influences  7.3a, 7.3b Human influences on the environment: decision making (risk/benefit)  LE 3.2b, LE 7.1e, LE .2c,d, ICT 1.2, 1.4, 2.1-2.3, 4.1, 4.2, 5.2, 6.1, 6.2, IPS 1.1-1.4, IPS 2.1  Environmental concerns: acquisition and depletion of resources; waste disposal; land use and urban growth; overpopulation, global warming, ozone depletion, acid rain air pollution, water pollution impact on other organisms  PS 5.1:a: Observe and describe the position of an object relative to another object (over, under, on top of, next to).  LE 1.1b: Describe the basic needs of plants: • Light • Air • Water • Soil (nutrients) • LE 1.1b: Describe the basic life functions of plants:  LE 1.2a: Grow LE 4.1b: Take in nutrients LE 5.1a: Reproduce Common Core • W.2.8: Recall information from experiences or gather information from provided sources to answer a question. • SL.2.1: Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. • SL.2.1b: Build on others’ talk in conversations by linking their comments to the remarks of others. • SL.2.2: Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.  Cloud EfS Standards • C 1: See the whole system, its parts, and their place within the system. • C 3: Be able to step back and see the big picture. UNIT 3: CONSERVE TO SUSTAIN © NY Sun Works | Discovering Sustainability Science 228 • C 4: See and describe how at least two variables of a system are related • C 28: Define how their own (or other peoples) actions affect the systems they are in. • C 29: Demonstrate an understanding of how one event can influence another. • D 5: Articulate how human choices regarding consumption, production, distribution, and disposal of material goods affect our ability to thrive. • D 7: Envision how their choices as individuals and as members of school, family, club, neighborhood, business, town, and prospective professional communities can contribute to the viability of a sustainable future. • F 1: Describe the role and interconnections among those subcomponents (terrestrial, aquatic, marine, and atmospheric) of our environmental system that support life on earth. This includes the relation of high quality and abundant water, soil, and air essential to support all life. • H 2: Demonstrate the ability to communicate and collaborate cross‐culturally. • H 7: Demonstrate the ability to work with people who present different perspectives and to synergistically communicate and cooperate to create shared visions, understandings, and policies far richer than anything that could have been achieved alone. • Discuss, analyze, identify relationships |
| Teacher Evaluation Components | 1e Designing Coherent Instruction  3b Using Questioning and Discussion Techniques  3c Engaging Students in Learning  3d Using Assessment in Instruction |

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| **Category** | **4** | **3** | **2** | **1** |
| **Illustration(s) of Worm Bin** | Illustration of worm bin is clear, detailed and includes all important parts and labels. | Illustration of creation is mostly clear, detailed and includes most labels. | Illustration of creation is somewhat clear, and includes some labels. | Illustration is not clear and does not have labels. |
| **Writing the How To** Sentences:  How do you make a worm bin?  Why do we add newspaper?  Why do we need to spray the newspaper with water?  What is the purpose of using a worm bin? | Wrote a clearly detailed “how to” and is able to explain why we use worm bins. | Wrote a mostly complete “how to” and was mostly able to respond to questions. | Wrote a somewhat complete “how to”. May or may not have responded to the other questions. | Wrote a basic “how to” with possible missing key information. |
| **Participation in Worm bin building** | Worked well with the group the whole time. Able to take turns in order to make a worm bin. | Was mostly working well with the group for at least half the time. | Tried to work with the group but either had a tough time or checked out. | Was not able to work well with the group. Either did not participate much or was a distraction to the group. |
| **Observation Center** | Worked nicely with the group to observe the worm bin. Gently handled the worms and followed observation rules (being quiet and respectful). | Mostly worked well with the group to observe the worm bin. | Tried to observe the worm bin, but was somewhat distracted. Could have been more respectful with the worm bin. | Was not able to follow the observation rules of the worm bins. Was not able to work well with the group. |

Student Rubric: